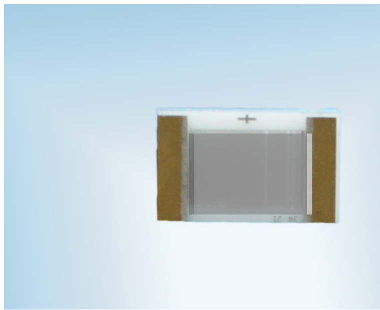
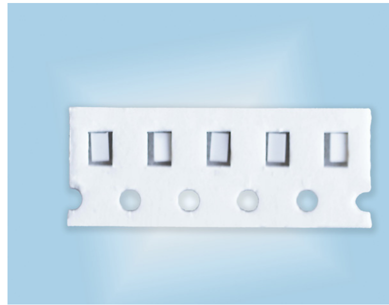
iST Innovative Sensor Technology
physical. chemical. biological.

FlipChip Series
Platinum thin film RTD
For the automatic assembling on PCBs


Sensor side up (top view)

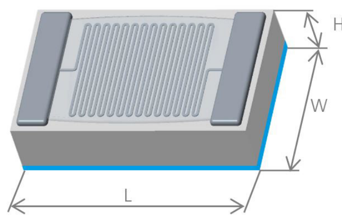

Taped on reel sensor side down

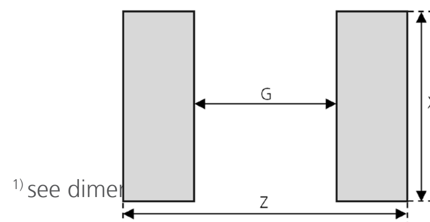
Reel

Benefits & Characteristics

- Excellent long-term stability and thermal cycling
- Low self-heating
- Automatic assembly in large-volume applications
- Fast response

Illustration [1)]





1) see dimensions

Dimensions

	Dimensions in mm			Land pattern in mm		
Sensor type	**L**	**W**	**H**	**Z**	**G**	**X**
0603 3FC	1.5 ± 0.15	0.75 ± 0.15	0.4 ±0.15	1.45	0.85	0.7
0805 3FC	1.9 ± 0.15	1.15 ± 0.15	0.4 ±0.15	2.70	1.10	1.40
0805 FC2	1.9 ± 0.15	1.15 ± 0.15	0.4 ±0.15	2.70	1.10	1.40

Technical Data

Electrical Specifications

Temperature range [2]	-50 °C to +250 °C	
Nominal resistance	100 Ω at 0 °C, 1000 Ω at 0 °C	
Characteristic	IEC 60751	
Tolerance class (dependent on temperature range)		IST AG reference
	IEC 60751 F0.15	A
	IEC 60751 F0.3	B
	IEC 60751 F0.6	C
Temperature coefficient	3850 ppm/K	
Temperature dependence of resistivity	according to IEC 60751:	
	-50 °C to 0 °C $R(T) = R_0 \times (1+A \times T + B \times T^2 + C \times [T-100] \times T^3$ 0 °C to +250 °C $R(T) = R_0 \times (1+A \times T + B \times T^2)$	
	$A = 3.9083 \times 10^{-3} \times °C^{-1}$ $B = -5.775 \times 10^{-7} \times °C^{-2}$ $C = -4.183 \times 10^{-12} \times °C^{-4}$ R_0= resistance value in Ω at 0°C T = temperature in accordance with ITS90	

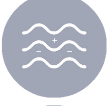
General Specifications

Pads 3FC: Pads FC2: (soldering connection)	Bondable, solderable Bondable, solderable, sinterable		
Soldering (according to J-STD-002E) see general notes 1.3	1. Solderability: following Test A and A1 in the standard 2. Resistance to soldering heat: following Test A and A1 in the standard		
Measuring current	Pt 100	Pt 500	Pt 1000
(Self-heating has to be considered)	1 mA	0.5 mA	0.3 mA
Long-term stability:	max. 0.04 % after 1000 hrs at +250°C		
Taping & Packaging	EIA-481 (for dimensions see [3])		
Storage Property	12 months (original packaging and dry conditions)		
REACH + RoHs Compliance	Yes		

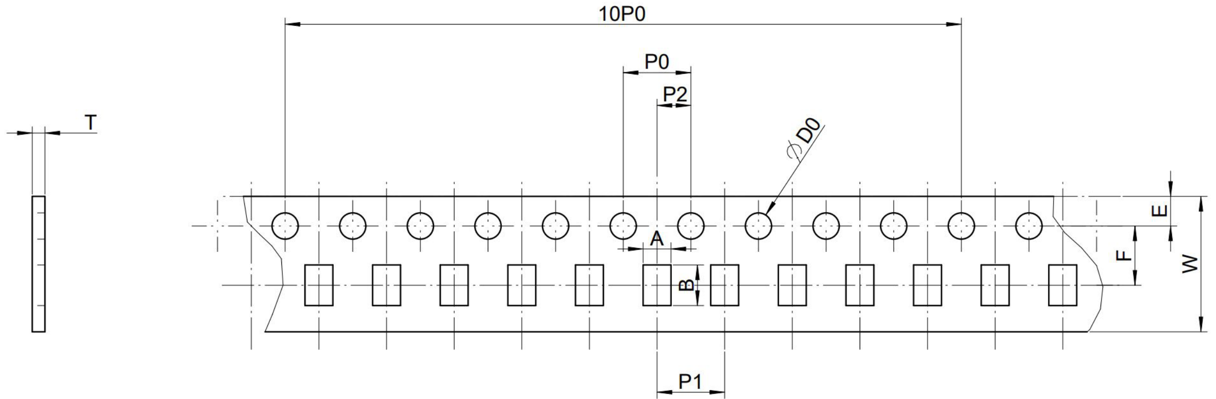
General notes

[2] The thermal coefficient of expansion of the circuit board has to be considered

[3]) Taping and packaging: see next page



Taping & Packaging

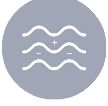


FC 0603

Item	A	B	W	E	F	P0	P1	P2	D0	T	10P0
Dimension	1.070	1.78	8.0	1.75	3.5	4.0	4.0	2.0	1.55	0.6	40.0
Min. tolerance	-0.05	-0.05	-0.1	-0.05	-0.05	-0.1	-0.1	-0.05	-0.05	-0.03	-0.1
Max. tolerance	0.05	0.05	0.1	0.05	0.05	0.1	0.1	0.05	0.05	0.03	0.1

FC 0805

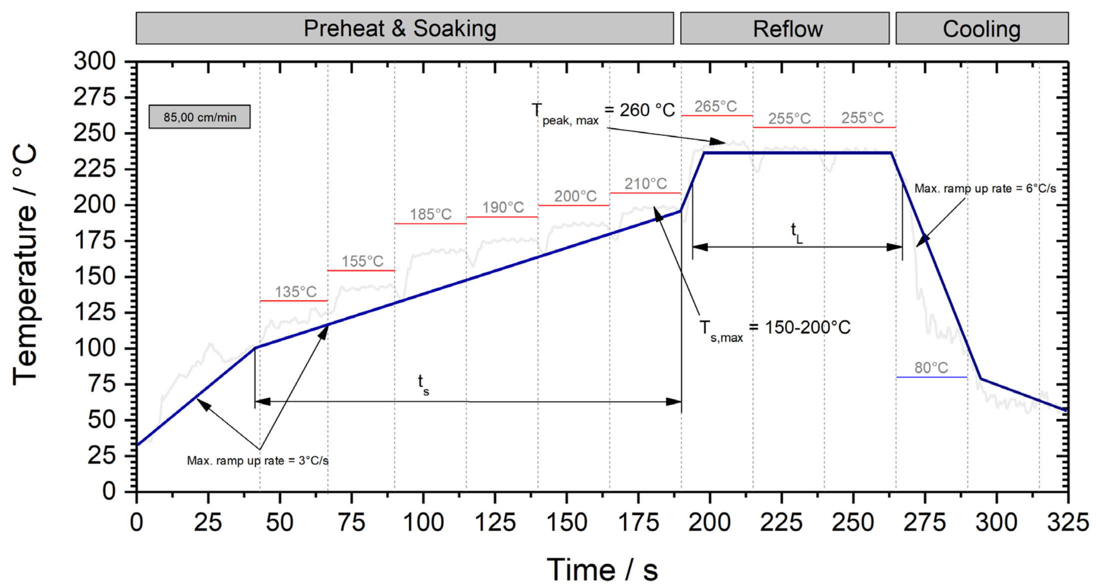
Item	A	B	W	E	F	P0	P1	P2	D0	T	10P0
Dimension	1.65	2.4	8.0	1.75	3.5	4.0	4.0	2.0	1.55	0.75	40.0
Min. tolerance	-0.05	-0.05	-0.1	-0.05	-0.05	-0.1	-0.1	-0.05	-0.05	-0.03	-0.1
Max. tolerance	0.05	0.05	0.1	0.05	0.05	0.1	0.1	0.05	0.05	0.03	0.1



Soldering and Reflow profile

For soldering IST AG recommends lead-free solder paste (Material: SnAgCu 96.5/3.0/0.5) and a temperature characteristic (reflow profile) for reflow soldering according to JEDEC J-STD-002E. The solderability was tested with following assembly conditions:

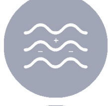
PCB Material:	FR4 (PCB Layer: 2)
PCB thickness:	1.6 mm
Dimensions:	72 x 32 mm
Solder Paste:	KOKI „S3X58-M406“ (Pb-free assembly)



Profile parameter	Temperature range / °C	Heating rate / °C / s	Time / s
Ramp to preheat	RT to 150	1.9 - 3	
Preaheat /Soak	$T_{s,min}$ = 100, $T_{s,max}$ = 200	1.9 - 3	$t_{s,\ min}$ = 60, $t_{s,\ max}$ = 160
Ramp to Peak	180 - 255	0.6	
Reflow	250 ± 5, $T_{peak,\ max}$ = 260		60 to 120, $t_{peak,\ max}$ = 30
Cooling	255 - RT	1.6 - 3	

Important notes:

- The solder or additional fluxes should be halogen-free, mild, and non-activated.
- After soldering, a thorough cleaning with pH-neutral defluxing material is recommended.
- The profile has a significant impact on the solder joint performance, i.e. solderability, wettability and strength.
- The soak profile and all other data serve as a guideline and cannot be regarded as binding statements or guaranteed values. They serve as a starting point for process development. Specifically, a high mix of components or large board sizes might require the development of a different soldering profile.
- Long-term stability in the application and chemical resistance need to be approved by the customer.
- The customer must test and approve the suitability of IST AG sensors in the customer's application.



Order Information

FlipChip 0603 3FC with bondable, solderable Au-Pads

Description	Tolerance class	Packaging type	Order number
Other tolerances, values of resistance are available on request			
Nominal resistance: 100 Ω at 0 °C			
P0K1.0603.3FC.A.S	IEC 60751 F0.15 (A)	tape only, without reel (sensor side down)	155609
P0K1.0603.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side up)	155610
P0K1.0603.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side down)	155611
P0K1.0603.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side up)	155613
P0K1.0603.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side down)	155614
Nominal resistance: 1000 Ω at 0 °C			
P1K0.0603.3FC.A.S	IEC 60751 F0.15 (A)	tape only, without reel (sensor side down)	155603
P1K0.0603.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side up)	155601
P1K0.0603.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side down)	155602
P1K0.0603.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side up)	154447
P1K0.0603.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side down)	154448

FlipChip 0805 3FC with solderable, bondable Au-Pads

Description	Tolerance class	Packaging type	Order number
Nominal resistance: 100 Ω at 0 °C			
P0K1.0805.3FC.A.S	IEC 60751 F0.15 (A)	tape only, without reel (sensor side down)	155650
P0K1.0805.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side up)	155651
P0K1.0805.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side down)	155652
P0K1.0805.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side up)	155653
P0K1.0805.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side down)	101330
Nominal resistance: 1000 Ω at 0 °C			
P1K0.0805.3FC.A.S	IEC 60751 F0.15 (A)	tape only, without reel (sensor side down)	155648
P1K0.0805.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side up)	101999
P1K0.0805.3FC.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side down)	155647
P1K0.0805.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side up)	155649
P1K0.0805.3FC.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side down)	101976

FlipChip 0805 FC2 with solderable, bondable and sinterable Au-Pads

Nominal resistance: 100 Ω at 0 °C			
P0K1.0805.FC2.A.S	IEC 60751 F0.15 (A)	tape only, without reel (sensor side down)	155656
P0K1.0805.FC2.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side down)	155662
P0K1.0805.FC2.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side up)	155661
P0K1.0805.FC2.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side down)	155664
P0K1.0805.FC2.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side up)	155663

Nominal resistance: 1000 Ω at 0 °C			
P1K0.0805.FC2.A.S	IEC 60751 F0.15 (A)	tape only, without reel (sensor side down)	155655
P1K0.0805.FC2.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side up)	155657
P1K0.0805.FC2.A.S	IEC 60751 F0.15 (A)	taped on reel (sensor side down)	155658
P1K0.0805.FC2.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side up)	155659
P1K0.0805.FC2.B.S	IEC 60751 F0.3 (B)	taped on reel (sensor side down)	155660

Additional documents

	Document name
Application note	ATP_E

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